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(54) **AGENTS DE SOINS POUR LA PEAU A DEUX PHASES**  
(54) **TWO-PHASE SKIN CARE AGENTS**

(57) L'invention concerne des agents de soins pour la peau à deux phases, notamment une crème de soins pour la peau à deux phases, qui comprennent deux constituants séparés à écoulement plastique, conditionnés dans un tube d'où ils peuvent être exprimés conjointement sous forme de joncs parallèles, concentriques ou rayés. Ces agents de soins pour la peau sont avantageux à préparer, si le premier constituant comporte une phase aqueuse continue et le second constituant, une phase huileuse continue. Les deux phases sont colorées ou pigmentées de préférence de manière différenciée. La phase aqueuse utilisée est de préférence un gel aqueux ou une émulsion huile dans l'eau et la phase huileuse est une huile épaissie ou une émulsion eau dans l'huile.

(57) Two-phase skin care agents, specially two-phase skin creams, comprising two separated plastic flowing constituents packed in a tube which can be pressed out of the tube in the form of parallel, concentric or striped strips. Said agents can be advantageously produced when the first component has a continuous aqueous phase and the second component has a continuous oil phase. Preferably, both phases are differently colored or pigmented. Preferably, an aqueous gel or an oil in water emulsion are used as a continuous aqueous phase, and a thickened oil or water-in-oil emulsion is used as a continuous oil phase.

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(54) Title: TWO-PHASE SKIN CARE AGENTS

(54) Bezeichnung: ZWEIFHASSEN-HAUTPFLEGEMITTEL

## (57) Abstract

Two-phase skin care agents, specially two-phase skin creams, comprising two separated plastic flowing constituents packed in a tube which can be pressed out of the tube in the form of parallel, concentric or striped strips. Said agents can be advantageously produced when the first component has a continuous aqueous phase and the second component has a continuous oil phase. Preferably, both phases are differently colored or pigmented. Preferably, an aqueous gel or an oil in water emulsion are used as a continuous aqueous phase, and a thickened oil or water-in-oil emulsion is used as a continuous oil phase.

## (57) Zusammenfassung

Zweiphasen-Hautpflegemittel, insbesondere Zweiphasen-Hautcremes, die aus zwei getrennten, plastisch fließenden Komponenten bestehen, die in einer Tube abgefüllt und aus dieser gemeinsam in Form paralleler, konzentrischer oder gestreifter Stränge auspressbar sind, lassen sich vorteilhaft herstellen, wenn die erste Komponente eine kontinuierliche wässrige Phase und die zweite Komponente eine kontinuierliche ölige Phase aufweist. Bevorzugt sind beide Phasen unterschiedlich gefärbt oder pigmentiert. Als kontinuierliche wässrige Phase wird bevorzugt ein wässriges Gel oder eine Öl-in-Wasser-Emulsion und als kontinuierliche Ölphase ein verdicktes Öl oder eine Wasser-in-Öl-Emulsion verwendet.

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### **"A Two-phase Skin-care Formulation"**

This invention relates to a two-phase skin-care formulation, preferably a two-phase skin creme, which is packed in a tube and which is designed to extruded therefrom in the form of parallel, concentric or striped strands.

There are various known tubes for holding cremes which consist of two components that are intended to be kept separate before use or are differently colored or pigmented and which are designed to be extruded from the tube in the form of parallel, concentric or striped strands. So far, however, this technique has only been applied on a significant scale in the case of toothpastes.

This may be attributable to the fact that there are many practical problems which are largely attributable to the fact that the components are not supposed to be mixed with one another before use in order to stop their ingredients, which are kept separate from one another, from reacting prematurely with one another or to ensure that the various components, on extrusion from the tube, remain discernible as separate phases, for example in the form of differently colored stripes.

Thus, in **DE-PS 820 268** for example, it is proposed to combine two individual tubes concentrically to form a single tube and to design the openings of the two individual tubes in such a way that, when pressure is applied to the outer tube, the two components emerge as a single strand with a core consisting of the contents of the inner tube.

However, an arrangement such as this is expensive and difficult to manufacture on an industrial scale. However, in the stripe dispensers according to **US 2,789,731**, **US 2,935,231** and **DE-A-2 141 436**, the carrier creme and the stripe creme are in danger of mixing at the phase boundary so that no clear phase boundaries are discernible in the strand extruded from the tube.

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Accordingly, the object of the present invention was to find a solution for skin-care and body-care products that would enable paste-form or creme-form preparations to be applied from tubes in the form of multiple-phase strands of which the individual phases would preferably have different colors.

Products such as these are not only particularly attractive to the consumer, they also enable active substances capable of reacting with one another or of being deactivated in the event of prolonged storage to be applied to the skin.

According to the invention, this problem has been solved by a skin-care or body-care formulation consisting of two separate, plastically flowing components accommodated in a tube from which they can be extruded together in the form of parallel, concentric or striped strands of both components, the first component comprising a continuous aqueous phase and the other a continuous oily phase.

In the context of the invention, skin-care or body-care formulations are understood to be products which protect and care for the skin or hair and which are applied to and remain on the skin or the hair in the form of plastically flowing preparations. The expression "plastically flowing" describes rheological behavior which is typical of paste-, cream- or gel-form systems and which is characterized by a yield point which makes the product look like a solid on exposure to a shear stress which is smaller than this yield point. Flow is only observed if the shear stress is greater than the yield point. The rheological behavior above the yield point can be described by semi-empirical equations of state, such as for example Bingham's equation or Casson's equation.

Tubes suitable for the extrusion of two separate, plastically flowing components in the form of concentric or striped product strands have been described many times and have long been commercially available for toothpastes with colored stripes. These tubes are designed in such a way that a small tube with openings at its end facing the tube opening projects into

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the tube from its opening. In the space around the small tube, the tube is filled with a second component, for example a colored second component, and underneath with the carrier component. The small tube must project into the carrier component. When pressure is applied to the tube, the carrier component is pressed through the small tube and against the second component which, in turn, is transported through the openings to the strand of carrier cream and extruded therewith. In this way, both components are dispensed together in the form of a strand. The strand can have narrow or fairly broad stripes of the second component according to the shape and size of the openings. If the opening is in the form of an annular gap, the carrier phase can be completely surrounded by the second phase. The product strand may be cylindrical, i.e. may have a circular cross-section, or non-cylindrical in shape, i.e. may have a polygonal cross-section, according to the shape of the tube opening.

According to the invention, the component with the continuous aqueous phase may be an aqueous gel, an aqueous dispersion, an oil-in-water emulsion or a water-in-oil-in-water emulsion, an aqueous microemulsion or a mixture of such systems. The only important requirement is that water should form the outer continuous phase, i.e. that the system should be spontaneously dilutable with water.

The aqueous gel may be, for example, an aqueous system thickened with hydrocolloids or surfactants or both. Aqueous systems thickened with inorganic thickeners, for example with silicas or layer silicates, are also suitable. An aqueous dispersion in the present context is a dispersion of solid particles in an aqueous medium, for example a dispersion of pigments, waxes or polymer particles. Oil-in-water emulsions and water-in-oil-in-water emulsions are the best known bases of cosmetic skin-care products. However, all the above-mentioned components with a continuous aqueous phase should have a viscosity of more than 0.1 Pa·s (20°C) and preferably more than 1 Pa·s (20°C) (dynamic viscosity above the yield point) either

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through suitable thickeners or through the presence of dispersed or emulsified phase.

The component with a continuous oil phase may be selected from oils and fats which have a viscosity of at least 0.1 Pa·s and preferably of at least 1 Pa·s (20°C) either through their molecular structure or by thickening with known thickeners. Suitable oils/fats are, for example, Vaseline (petrolatum) or other vegetable, animal or synthetic fats and silicones which are emollient-like or flow plastically at 20°C. Oils of relatively low viscosity or those with no yield point should be converted into a plastically flowing state by known oil-soluble thickeners, for example by soaps, oil-soluble polymers, organically modified layer silicates or dissolved waxes. Another way of converting oils into a plastically flowing state is to incorporate a discontinuous aqueous phase, which may optionally be an oil-in-water emulsion, by emulsification. Water-in-oil emulsions or oil-in-water-in-oil emulsions formed in this way can be obtained as plastically flowing systems (creme) either through the viscosity of the outer oil phase or through the quantity of the inner aqueous phase.

The continuous aqueous phase is preferably an aqueous gel or an oil-in-water emulsion while the continuous oil phase is preferably a thickened oil or a water-in-oil emulsion. The two plastically flowing components preferably have a yield point in the range from 50 to 500 Pa (Pascal).

In the interests of high stability of the phase boundary to "bleeding" or mixing, it is also of advantage if the difference between the yield points of the two components is no greater than 20%, based on the higher yield point.

Besides the thickeners or the emulsified phase, the two components of the two-phase skin-care formulation according to the invention may contain any typical components for the desired application in suitable concentrations.

Preferred skin- and body-care formulations according to the invention are those in which the two phases are differently colored or pigmented and, in this way, have an aesthetically particularly attractive appearance through the colors of the product strand issuing from the tube.

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Suitable dyes are any water-soluble or oil-soluble dyes which are approved for the coloring of cosmetic products. For example, the oil phase may be colored with oil-soluble dyes while the aqueous phase may be opacified with dispersed pigments. The aqueous phase may also be a clear colored gel while the oil phase may be a white optionally pigmented water-in-oil creme. Another option, for example, would be to formulate the oily phase as a clear, optionally colored gel and the aqueous phase as a pigmented, white oil-in-water creme.

In conjunction with the shape of the tube opening and with the number, size and shape of the openings through which the second component emerges from the tube, an aesthetically very diverse product strand can be obtained.

In addition, different cosmetic agents may be added to the two components so that, for example, the aqueous phase may contain cleansing agents while the oily phase may contain skin-care components. Liposomes, for example, may even be added to the aqueous phase, being unstable in the oily phase. For example, active substances unstable or insoluble in the presence of water could be added to the oily phase.

The invention is illustrated by the following Example.

### **Example**

An o/w carrier cream and a w/o stripe cream with the following compositions were introduced into the tube dispenser according to **DE-A-3 841 775**. The w/o night creme formed the stripe cream while the o/w day cream formed the carrier cream. In all, 118 ml of carrier cream and 7 ml of stripe cream were packed in a 125 ml tube.

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**Carrier creme (o/w)**

Stearic acid	8.0% by weight
Cetyl/stearyl alcohol	1.5% by weight
Cetyl/stearyl alcohol + 20 moles EO	2.0% by weight
2-Octyl dodecanol	5.0% by weight
Cera Alba	3.0% by weight
Paraffinum liquidum	10.0% by weight
p-Hydroxybenzoic acid propyl ester	0.3% by weight
Tocopheryl acetate	2.0% by weight
Benzophenone-3	1.0% by weight
Propylene glycol	5.0% by weight
Glycerol	5.0% by weight
p-Hydroxybenzoic acid methyl ester	0.3% by weight
Triethanolamine	0.3% by weight
Water	to 100% by weight

**Stripe cream**

Dehymuls F	8.0% by weight
Shea butter	5.0% by weight
Petrolatum	10.0% by weight
Paraffinum liquidum	5.0% by weight



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Methyl paraben	0.3% by weight
Tocopheryl acetate	2.0% by weight
Propylene glycol	5.0% by weight
Glycerol	5.0% by weight
Magnesium sulfate	0.5% by weight
Phenoxyethanol	1.0% by weight
Acid Orange 24 (C.I. 20170)	0.5% by weight
Water	to 100% by weight

When the tube was squeezed, a square strand of the carrier creme with orange-colored stripes of the w/o creme at the edges of the carrier strand was obtained. The phase boundary between the carrier creme and the orange-colored stripes remained stable for 4 weeks.

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**CLAIMS**

1. A skin-care and body-care formulation consisting of two separate, plastically flowing components accommodated in a tube from which they can be extruded together in the form of parallel, concentric or striped strands of both components, characterized in that the first component comprises a continuous aqueous phase and the second component a continuous oily phase.
2. A skin-care and body-care formulation as claimed in claim 1, characterized in that the two phases are differently colored or pigmented.
3. A skin-care and body-care formulation as claimed in claim 1 or 2, characterized in that the continuous aqueous phase is an aqueous gel or an oil-in-water emulsion and the continuous phase is a thickened oil or a water-in-oil emulsion.
4. A skin-care and body-care formulation as claimed in any of claims 1 to 3, characterized in that the aqueous phase and the oily phase have yield points of 50 to 500 Pa at 20°C.

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